

**CLAIMS**

1. A method for extending the radio coverage area (13) of a communication system (20) operating according to a predetermined radio protocol (40), the system comprising a primary station (12) having a radio coverage area, a first secondary station (22) within the coverage area and a further secondary station (24) which is located outside of the radio coverage area of the primary station, the method comprising a message exchange process (80,84) in which:
- 10      • the first secondary station receives from the primary station messages intended for the further secondary station; and
- transmits said messages to the further secondary station;
- and
- the first secondary station receives from the further secondary station
- 15      messages intended for the primary station; and
- transmits said messages to the primary station.
2. A method according to claim 1, wherein the message exchange process follows a registration process (58) in which:
- 20      • the further secondary station (24) transmits to the first secondary station (22) a message comprising registration information, and
- the first secondary station (22) transmits said registration information to the primary station (12) to register the further secondary station (24) with the primary station.

3. A method according to claim 2, wherein the registration information comprises a unique identifier identifying the further secondary station (24), and wherein:

- the primary station (12) registers the further secondary station by allocating a first identifier (68) associated with the unique identifier of that station and transmits (70) said first identifier to the first secondary station (22),
  - and wherein the first secondary station (22) allocates a second identifier (62) associated with the first identifier and with the unique identifier and transmits the second identifier to the further secondary station (24),
- and wherein messages are subsequently exchanged (80,84) according to the associated identifiers.

4. A method according to claim 3, wherein communication between the primary station (12) and the first secondary station (22) is synchronised according to a first periodic beacon signal transmitted by said primary station.

5. A method according to claim 4, wherein the first secondary station (22) reserves a portion of the time period between the periodic beacon signals, and wherein the first secondary station transmits and receives messages to and from the further secondary station (24) during this reserved time period.

6. A method according to any preceding claim, wherein the predetermined radio protocol (40) is that defined as the ZigBee radio standard.

7. A communication system operating according to a predetermined radio protocol and comprising a primary station (12) having a radio coverage area (13), a first secondary station (22) within the coverage area and a further secondary station (24) which is located outside of the radio coverage area of the primary station, the first secondary station having means (32,34,50) for receiving from the primary station messages intended for the further secondary

station, for transmitting said messages to the further secondary station, for receiving from the further secondary station messages intended for the primary station and for transmitting said messages to the primary station.

5           8.     A communication system according to claim 7, wherein the first secondary station (22) further comprises means for receiving a message comprising registration information from the further secondary station (24) and means for transmitting said registration information to the primary station (12) to register the further secondary station with the primary station.

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          9.     A communication system according to claim 7 or claim 8, wherein the exchange of messages (84) between the primary station (12) and the first secondary station (22) is synchronised according to a periodic beacon signal transmitted by said primary station.

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          10.    A communication system according to claim 9, wherein the first secondary station (22) reserves a portion of the time period between the periodic beacon signals, and wherein the first secondary station transmits to, and receives messages from the further secondary station (24) during this reserved time period.

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          11.    A communication system according to any one of claims 7 to 10, wherein the predetermined radio protocol (40) corresponds to the ZigBee radio standard.

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          12.    A first secondary station (22) for use in a communication system (20) operating according to a predetermined radio protocol (40) and having a primary station (12) having a radio coverage area, and a further secondary station (24) which is located outside of the radio coverage area of the primary station, the first secondary station (22) being located within the radio coverage area of the primary station and comprising means for receiving from the primary station messages intended for the further secondary station, for

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transmitting said messages to the further secondary station, for receiving from the further secondary station messages intended for the primary station and for transmitting said messages to the primary station.

5           13. A first secondary station as claimed in claim 12 further comprising means for receiving a message comprising registration information from the further secondary station and means for transmitting said registration information to the primary station to register the further secondary station with the primary station.

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          14. A first secondary station as claimed in claim 12 or claim 13 wherein the predetermined radio protocol corresponds to the ZigBee radio standard.

15           15. A method for extending the radio coverage area of a communication system (20) substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

          16. A communication system (20) having an extended radio  
20 coverage area (13,13a) and constructed and arranged to operate substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

          17. A first secondary station (22) constructed and arranged to  
25 operate substantially as hereinbefore described with reference to and as shown in the accompanying drawings.